Columbia.—E. DE WILDEMAN (Rep. Sp. Nov. **13**:369–384. 1914) has published 35 new species and varieties of flowering plants from Central Africa and characterizes two new genera, namely *Brieya* of the Anonaceae and *Giorgiella* of the Passifloraceae. The same author (Bull. Jard. Bot. Brux. **4**:1–241. 1914) in cooperation with specialists has issued "Additions à la flore du Congo." Several species new to science are included and the following new genera are proposed: *Volutellopsis* and *Gilletia* Torrend of the Mucedinaceae.—G. W. WILSON (Mycologia **6**:192–210. *pls. 135, 136*. 1914) in continuation of his studies on the Peronosporales describes several new species and propose as new genus (*Bremiella*) based on *Peronospora megasperma* A. Berlese.—L. WITTMACK (Bot. Jahrb. **50**:539–555. 1914. Supplement-Band) has published 6 new species of *Solanum* from South America.—N. WORONICHIN (Bull. für Ang. Bot. **7**:431–440. *pl. 120*. 1914) describes and illustrates a new fungus (*Plectodiscella piri*) found in the Kaukasus. The genus is said to represent a new family, namely the Plectodiscelleae.—C. H. WRIGHT (Bull. Kew p. 330. 1914) has published a new species of *Hippeastrum* (*H. Elwesii*) from Argentina. The same author (Curtis' Bot. Mag. *pl. 8553*. 1914) describes and illustrates a new species of *Zephyranthes* (*Z. cardinalis*) from specimens growing in the Kew Gardens but presumably of American origin.—J. M. GREENMAN.

Root nodules.—BOTTOMLEY[5] has investigated the root nodules of *Ceanothus americanus*, to which attention was called by BEAL in 1890. He finds that the nodules are modified lateral roots which increase in size each year by the formation of endogenous outgrowths similar in structure to the primary branch. Each nodule when fully grown shows an apical meristematic zone, an infection zone, a bacterial zone, and a basal zone almost free from bacteria. The bacteria when isolated and grown in pure cultures can fix free nitrogen, and evidently belong to the *Bacillus radicicola* group.

Miss SPRATT[6] has studied the well known root nodules or "coralline roots" of the cycads, and finds that all the genera produce them. They are developed primarily by infection with *Bacillus radicicola*, and at the base of each nodule a whorl of lenticels or a continuous zone of parenchyma is produced. The outer cell walls become pushed apart, and are infected by *Azotobacter*, and under certain conditions by *Anabaena* also. The alga is said to stimulate the phellogen to produce other lenticels, from which a zone of tissue is produced that includes the original outer cells in which the alga and bacteria occur. The algal zone is continuous, and consists of a large air space containing *Anabaena* and *Azotobacter*, which is kept intact by papillate cells traversing it from both inner

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[5] BOTTOMLEY, W. B., The root nodules of *Ceanothus americanus*. Ann. Botany **29**:605–610. *pl. 28*. 1915.

[6] SPRATT, ETHEL ROSE, The root nodules of the Cycadaceae. Ann. Botany **29**: 619–626. *pl. 29*. 1915.

and outer tissues. No algal zone has been observed in *Macrozamia*, *Zamia*, *Ceratozamia*, and *Bowenia*, but nodules are produced containing *Bacillus radicicola* and *Azotobacter*. The author states that the cycads are the only nodule-bearing plants known in which four organisms are in symbiotic relationship, namely, two nitrogen-fixing bacteria, an alga, and a cycad.—J. M. C.

Sexual reactions of mucors.—BLAKESLEE[7] has been hybridizing mucors and has secured some interesting results. His (+) and (−) strains have become familiar, and he has shown that the majority of mucors are dioecious. In the experiments presented in this paper he has crossed hermaphroditic species with the sexual races of dioecious forms. It seems that some of these hermaphrodites are heterogamic, showing a constant difference in the size of their gametes, the larger one being presumably female and the smaller one male. A sexual reaction was obtained between the (+) strain of a dioecious mucor and the smaller gamete of the hermaphrodite; and conversely, a similar reaction between the (−) strain of the dioecious form and the larger gamete of the hermaphrodite. The conclusion is obvious that the (+) strain of dioecious mucors is female and the (−) strain male.—J. M. C.

Development of Pyronema.—BROWN[8] has investigated a form of *Pyronema confluens*, which he calls var. *inigneum*, in which the trichogyne does not fuse with the antheridium. He finds also that the cultural conditions for the growth of the variety appear to differ from those for the normal form in that sterilization of the substratum is unnecessary. No fusion of nuclei was observed in the ascogonium or ascogenous hyphae, the only one occurring in the asci. The fact that a species and its variety differ from one another in the distinct occurrence of the sex act and its entire absence is a striking illustration of the relation between the dependent habit and the sexual apparatus.—J. M. C.

Myxomycetes of Wisconsin.—DEAN[9] has published a descriptive list of the Myxomycetes of Wisconsin, 74 species having been identified, representing 28 genera. The relatively large genera are *Physarum* (10), *Diderma* (6), *Comatricha* (5), *Arcyria* (5), and *Trichia* (5). The descriptions are full and accompanied by critical notes.—J. M. C.

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[7] BLAKESLEE, A. F., Sexual reactions between hermaphroditic and dioecious mucors. Biol. Bull. **29**:87–89. *pls. 3*. 1915.

[8] BROWN, WILLIAM H., The development of *Pyronema confluens* var. *inigneum*. Amer. Jour. Bot. **2**:289–297. 1915.

[9] DEAN, ALLETTA F., The Myxomycetes of Wisconsin. Trans. Wisc. Acad. Sci. **17**:1221–1299. 1914.